Introduction to Knowledge Management

U.S. Army Logistic Management College

Intelligent Technologies for Operations Research

Motivation

“The empires of the future are empires of the mind.”

Winston Churchill

“The fundamental building material of a modern corporation is knowledge.”

Valery Kanavsky, Hewlett-Packard

- **Appear to be so true- currently a whole new area of practice is emerging in business management centering on concepts such as knowledge management and collaborative intelligence.**

Motivation

"The only thing that gives an organization a competitive

edge is what it knows, how it uses what it knows, & how

fast it can know something new."

Laurence Prusak, in *Strategy and Leadership*

- **The ability to encapsulate and leverage corporate experience is a critical factor effecting an organization's competitiveness in the future.**
- **Crux- maximize knowledge value to create more responsive and adaptive organizations.**

Motivation

- **New knowledge equation:**
  - **Knowledge = Power- so share it & it will multiply**
- **What is needed is systematic knowledge acquisition, management, and distribution.**
- **Once knowledge is stored, it can be shared throughout the organization.**
- **In 1999, corporations will spend $5 billion to better leverage their knowledge resources.**

Outline

- What do we mean by Knowledge?
- What is Knowledge Management?
- Knowledge Management Process
- KM Technologies and Techniques
- Knowledge Management Benefits
- Knowledge Management Tools
- Army Knowledge Management Initiatives

Definition of Knowledge

- **Webster: Condition of knowing something with familiarity gained thru experience or association.**
- **Also: Ideas or understandings an entity possesses used to take actions to achieve the entity's goals.**
- **May be recorded in an individual's brain or stored in organizational processes, products, facilities, systems, and documents.**
- **Bottomline: Experience & information that can be communicated and shared.**

Knowledge Continuum

- Data- **a value without reference context or meaningful relation to anything else**
- Information- **an understanding of relationships between pieces of data (the what)**
  - **does not provide foundation for why data is what it is nor indication how it is likely to change over time**
- Knowledge- **understand the information and its implications (adds who, when, where, & how)**

Knowledge Continuum Example

Bank Savings Acct concept including principal, interest, and interest rate.

- Data- the numbers 100 or 5% out of context
- Information- Use of Savings Acct concept to establish context
  - Principal is the amount of money, $100, in the account
  - Interest rate, 5%, is factor used to compute interest on principal
- Knowledge- If I put $100 in my savings acct, & the bank pays 5% interest yearly, then at the end of a year the bank will compute the interest of $5 and my principal will be $105.
  - Moreso: If I deposit more $ in my acct, I will earn more interest; while if I withdraw $, then I will earn less interest.

More Detailed Knowledge Categorization

- **Data:** {facts, statistics}
- **Hands-on skills:** {practical steps to do my job}
- **Technical expertise:** {how things work in my field}
- **Professional knowledge:** {who are signif people or organ.}
- **Theories, concepts, & principles :** {abstract and theoretical knowledge}
- **Ethics & Values :** {knowledge that dictates professional standards in my field}

Corporate Knowledge

- Comprises the facts, rules, models, and concepts that underpin the day-to-day decisions made at every level in the organization
- Buried in reports, instructional manuals, policies, and procedures
- Resides with internal human experts in form of domain knowledge
- Until all of this is compiled and stored, the corporate knowledge resides in islands of info

Knowledge Sources

- **Textual documents** (e.g., reports, manuals, patents)
- **Policies and Procedures** (e.g., best practices)
- **Employees experience** (aka. domain experts)
- **Databases** (organizational and customer)
- **Lessons learned and shared stories**
- **Working solutions**
- **Webs of internal & external relationships**
- **Benchmarks** (winning strategies, innovative ideas)

Why is Knowledge Valuable?

- In today's fast paced society, an organization's corporate knowledge is quickly becoming it's only sustainable competitive advantage.
- The organization's knowledge directly supports the mission and core competencies.
- This resource must be protected, cultivated, and shared among the organization's members.

Major Knowledge Problems

- Knowledge bottleneck
- Corporate amnesia
- Sub-optimal decision making
- Wasted resources

Knowledge Management

- Process of creating a repository of Corporate Knowledge by gathering and compiling knowledge from various sources within the organization, disseminating the knowledge throughout the organization, and continuously refining the breadth and depth of the knowledge.
- Systematic process of finding, selecting, organizing, distilling, and disseminating organizational knowledge for such tasks as strategic planning, decision making, problem solving, & dynamic lng.

Why Knowledge Management?

- **Key business problem: Knowledge acquired through experience doesn't get reused because it isn't shared in a formal way.**
- **Solution: Knowledge Management to:**
  - **avoid remaking mistakes**
  - **assure reuse of proven best practices**
  - **capture what employees have learned about suppliers, customers, or competitors**
- **KM makes knowledge available to the people who can apply it.**

Value of Knowledge Management

- **Every situation is addressed with the sum total of everything the organization has ever learned about a situation of similar nature.**
- **Enhances the organization's ability to support:**
  - Mission
  - Performance
  - Competitive edge
  - Adaptation to change

History of Knowledge Management

- KM has been around since our ancestors transferred the skill to make a fire.
- Early and continued Knowledge Managers
  - Librarians, Teachers, & Master craftsmen
- Later added
  - Database managers
- Today
  - Chief Knowledge Officers
  - Intellectual Capital Directors

Approach to Knowledge Management

- Identify knowledge needs and assets
- Design, develop, and implement KM strategies to:
  - meet existing needs
  - develop new opportunities
- KM strategies and solutions encompass:
  - People aspects- job design, recruitment, retention, training, development, & cultural change
  - Technology aspects- information technology systems, knowledge based systems, data mining systems

Knowledge Management Process

- Gathering
- Codifying (Organizing & Refining)
- Disseminating

Techniques/Technologies

- **Knowledge Gathering-** collecting new facts, ideas, documents, solutions, experiences, patterns, processes, etc.
  - **Acquisition**
    - **Intelligent searches and Intelligent agents**
    - **Example: grapeVINE**
  - **Synthesis**
    - **Combining ideas from diverse sources to create new ideas**
    - **Examples: Data Mining tools, IdeaFisher, Inspiration**
  - **Creation**
    - **Examples: Idea Generator, MindLink**

Techniques/Technologies

- **Knowledge Codification-** representing, organizing, and storing of knowledge so it can be accessed and transferred
  - **Types of knowledge to code**
    - **Factual Knowledge (information about things/people)**
    - **Procedural Knowledge (information on how to do things)**
    - **Catalog Knowledge (knowing where things are located)**
    - **Cultural Knowledge (knowing how things actually get done)**
  - **Methods with which to code the knowledge**
    - **Knowledge bases**
    - **Knowledge Maps**
    - **Organizational Thesaurus and Dictionary**

Techniques/Technologies

- **Knowledge Transfer-** real power is in effective transfer of knowledge from one segment of the organization to another
  - **Barriers to sharing knowledge**
    - **Temporal (time) distance**
      - **Historical- organizational memory issue**
      - **Current- schedule coordination**
    - **Spatial distance**
      - **Organizations are increasingly spread out (& even global)**
    - **Social distance**
      - **Hierarchical, functional, & cultural differences**

Techniques/Technologies

- **Knowledge Transfer (con't)**
  - **Tools to overcome barriers to sharing knowledge**
    - **Temporal (time) distance**
      - **Historical- knowledge repositories**
      - **Current- intranets, groupware, email**
    - **Spatial distance**
      - **Enterprise intranets, groupware, virtual talk rooms**
      - **Software combining video, voice, & document sharing at desktop**
    - **Social distance**
      - **Tools to bridge the gaps such as learning maps which represent corporate, strategic plans in terms of objectives & activities that drive the success of the business**

KM Delivery Medium(s)

- **Structured so knowledge is easily accessible to all employees**
  - **K=(I + P)*S {Knowledge = (Information + People)*Sharing}**
- **Generally consists of**
  - **Corporate knowledge repository and knowledge map**
  - **Corporate intranet**
  - **Server based application on LAN/WAN**
  - **Email and WWW (Internet)**
  - **Potentially an extranet**

Benefits of Knowledge Management

- Key organizational resource: employee's expertise
- Harnessing intellectual capital in a repository allows organization to retain the knowledge permanently & makes it available to all employees.
- Gives employee the power of organization's collective knowledge at the place & time needed.
- Workforce is more knowledgeable, productive & able to support the organization's mission.

Who is using KM

- Arthur Anderson
- Xerox
- KPMG Peat Marwick
- Chevron
- Hughes Space & Commo
- Hewlett-Packard
- Dow Chemical
- Coca-Cola
- The World Bank
- Lincoln Life
- Monsanto
- General Motors
- Philip Morris
- Texas Instruments
- AT&T
- 3M
- Silicon Graphics
- Levi Strauss
- National Semiconductor
- Federal Express
- IBM
- U.S. Army

Impressions from Corporate America?

- **Results of survey conducted by Delphi Group in April 1998**
  - **Sectors surveyed: financial, manufacturing, government, etc**
  - **Who surveyed: 500 executives, managers, & information technology professionals**
  - **Responses**
    - **80% view KM as important contribution to business practice**
    - **51% reported active effort in KM**
    - **46% saw KM as offering a strategic advantage**

Knowledge Management Initiatives

- **Hewlett Packard (1995 formed KM Group)**
  - Knowledge Links- web based system which stores company knowledge accessible to all employees
- **Dow Chemical**
  - 25,000 patents in knowledge base used by all divisions to explore how to use to gain revenue
- **Chevron**
  - Created ‘best practices’ knowledge base storing experience of drilling conditions & innovative solutions for sharing globally with other sites

Knowledge Management Initiatives

- **Motorola (Compass)**
  - Web based knowledge repository and group collaboration system for documents, discussions, email, and relevant web sites for company wide knowledge sharing. Consists of a company wide information directory and search engine. Intelligent agents can scour Compass for relevant information.
- **McKinsey Co. (management consultant)**
  - Developed knowledge base containing experiences from every assignment including team members

Knowledge Management Initiatives

- **Texas Instruments**
  - **Best Practice Facilitator Network: Custom designed knowledge base including best practices, company & contact as well as online access to best practice library**
- **Eastman Kodak, GM, Hughes Electronics, Motorola, Arthur Anderson**
  - **All have created benchmarking and best practice knowledge bases and communication channels to support knowledge sharing**

Knowledge Worker Skills

- Overall understanding of their organization's business and how their work fits in
- Ability to apply new technologies to their business contexts
- Capability of judging if organization's best practices can be used for their current situation
- Creative and comfortable with inquiry-driven learning